

US009881277B2

# (12) United States Patent Brady

# (10) Patent No.: US 9,881,277 B2 (45) Date of Patent: Jan. 30, 2018

#### (54) WRIST BAND HAPTIC FEEDBACK SYSTEM

(71) Applicant: Amazon Technologies, Inc., Seattle,

WA (US)

(72) Inventor: Tye Michael Brady, Southborough,

MA (US)

(73) Assignee: Amazon Technologies, Inc., Seattle,

WA (US)

(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 15/083,107

(22) Filed: Mar. 28, 2016

(65) Prior Publication Data

US 2017/0278052 A1 Sep. 28, 2017

(51) Int. Cl. G06K 7/10 (2006.01) G06Q 10/08 (2012.01)

(52) U.S. CI. CPC ...... *G06Q 10/087* (2013.01); *G06K 7/10891* (2013.01)

(58) Field of Classification Search

## (56) References Cited

#### U.S. PATENT DOCUMENTS

7,504,949	В1	3/2009	Rouaix et al.	
7,911,324	B2 *	3/2011	Breed	G01S 13/878
				307/10.1
8,280,547	B2	10/2012	D'Andrea et al.	

9,087,314 9,242,799 2007/0063895	В1	1/2016	Hoffman et al. O'Brien et al. August	G06K 7/0008				
2007/0156312	A1*	7/2007	Breed	342/359 B60C 23/007 701/31.4				
2009/0207694	Al	8/2009	Guigne et al.	701/31.4				
(Continued)								

#### OTHER PUBLICATIONS

U.S. Appl. No. 15/083,083, filed Mar. 28, 2016, Titled: Ultrasonic Bracelet and Receiver for Detecting Position in 2D Plane.

(Continued)

Primary Examiner — Allyson Trail (74) Attorney, Agent, or Firm — Kilpatrick Townsend & Stockton LLP

### (57) ABSTRACT

Inventory management systems and related methods employ radio frequency based tracking of a worker's hands to monitor performance of inventory tasks. An inventory management system includes inventory bins, a user-wearable unit configured to be worn in proximity to a user's hand, fixed RF antennas configured to transmit at least one RF interrogation signal and receive at least one RF response signal, a RF transceiver operatively coupled with the fixed RF antennas, and a management module operatively coupled with the RF transceiver. The user-wearable unit includes an RF transceiver configured to transmit RF response signals in response to reception of the at least one RF interrogation signal. The management module is configured to process signals generated by the RF transceiver to track locations of the user-wearable unit and identify an inventory bin based on proximity of the user-wearable unit to the identified inventory bin to monitor performance of an inventory system task.

#### 20 Claims, 17 Drawing Sheets

